

Sir:

In response to the February 3, 2000 Office Action, the term for response to which has been extended one month pursuant to the petition under 37 CFR 1.136 set out herein, please amend the application as follows:

**In the title:**

Replace       **"VECTOR FOR ACTIVATING THE IMMUNE SYSTEM AGAINST CELLS  
ASSOCIATED TO PAPILLOMAVIRUSES OR SEQUENCES THEREOF"**

with           **--VECTOR ENCODING PAPILLOMAVIRUS FUSION POLYPEPTIDE--.**

**In the claims:**

Cancel claims 1-13, and add new claims 14-66:

- Sub B' 14. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:
- (a) a structural papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: L1-ORF and L2-ORF, and fragments of any of the foregoing ORFs; and
  - (b) an early papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF, E7-ORF and fragments of any of the foregoing ORFs.
15. The vector of claim 14 wherein the structural papillomavirus polypeptide is an HPV polypeptide.
16. The vector of claim 15 wherein the HPV is selected from the group consisting of HPV 16, HPV 18, HPV 33, HPV 35 and HPV 45.
17. The vector of claim 14 wherein the early papillomavirus polypeptide is an HPV polypeptide.

18. The vector of claim 17 wherein the HPV is selected from the group consisting of HPV 16, HPV 18, HPV 33, HPV 35 and HPV 45.
19. The vector of claim 14 wherein both the structural papillomavirus polypeptide and the early papillomavirus polypeptide are HPV polypeptides.
20. The vector of claim 19 wherein the HPV is selected from the group consisting of HPV 16, HPV 18, HPV 33, HPV 35 and HPV 45.
21. The vector of claim 14 wherein the nucleotide sequence is under the control of a constitutive promoter.
22. The vector of claim 14 wherein the nucleotide sequence is under the control of an inducible promoter.
23. The vector of claim 14 wherein the nucleotide sequence is under the control of a tissue-specific promoter.
24. The vector of claim 14 wherein the nucleotide sequence is under the control of a tumor-specific promoter.
25. The vector of claim 14 wherein the structural papillomavirus polypeptide is encoded by L1-ORF.
26. The vector of claim 14 wherein the structural papillomavirus polypeptide is encoded by a fragment of L1-ORF.
27. The vector of claim 14 wherein the structural papillomavirus polypeptide is encoded by L2-ORF.
28. The vector of claim 14 wherein the structural papillomavirus polypeptide is encoded by a fragment of L2-ORF.
29. The vector of claim 14 wherein the structural papillomavirus polypeptide is encoded by HPV 16 L1 ORF.
30. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E1-ORF.

31. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E1-ORF.
32. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E2-ORF.
33. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E2-ORF.
34. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E4-ORF.
35. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E4-ORF.
36. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E5-ORF.
37. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E5-ORF.
38. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E6-ORF.
39. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E6-ORF.
40. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by E7-ORF.
41. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by a fragment of E7-ORF.
42. The vector of claim 14 wherein the early papillomavirus polypeptide is encoded by HPV 16 E6-ORF.
43. The vector of claim 14 wherein:
- (a) the early papillomavirus polypeptide is encoded by E6-ORF or a fragment thereof; and

- (b) structural papillomavirus polypeptide is encoded by L2-ORF or a fragment thereof.

44. The vector of claim 14 wherein:

- (a) the early papillomavirus polypeptide is encoded by HPV 16 E7-ORF or a fragment thereof; and
- (b) structural papillomavirus polypeptide is encoded by HPV 16 L2-ORF or a fragment thereof.

45. The vector of claim 14 wherein:

- (a) the early papillomavirus polypeptide is encoded by HPV 16 E6-ORF or a fragment thereof; and
- (b) structural papillomavirus polypeptide is encoded by HPV 16 L2-ORF or a fragment thereof.

46. The vector of claim 14 wherein:

- (a) the early papillomavirus polypeptide is encoded by HPV 16 E7-ORF or a fragment thereof; and
- (b) structural papillomavirus polypeptide is encoded by HPV 16 L2-ORF or a fragment thereof.

47. The vector of claim 14 wherein:

- (a) the early papillomavirus polypeptide is encoded by HPV 18 E6-ORF or a fragment thereof; and
- (b) structural papillomavirus polypeptide is encoded by HPV 18 L2-ORF or a fragment thereof.

48. The vector of claim 14 wherein:

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- (a) the early papillomavirus polypeptide is encoded by HPV 18 E7-ORF or a fragment thereof; and
- (b) structural papillomavirus polypeptide is encoded by HPV 18 L2-ORF or a fragment thereof.

sub 50

49. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:

- (a) a structural human papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: L1-ORF and L2-ORF; and
- (b) an early human papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF and E7-ORF.

50. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:

- (a) a structural human papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: L1-ORF and L2-ORF; and
- (b) an early human papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF and E7-ORF;

wherein the human papillomavirus of (a) and (b) is selected from the group consisting of HPV 16, HPV 18, HPV 33, HPV 35 and HPV 45.

51. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:

- (a) a structural human papillomavirus polypeptide encoded by L1-ORF or a fragment thereof; and

- (b) an early human papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: E6-ORF and E7-ORF and fragments of any of the foregoing ORFs.
52. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:
- (a) a structural human papillomavirus polypeptide encoded by HPV 16 or 18 L1-ORF or a fragment thereof; and
- (b) an early human papillomavirus polypeptide encoded by an HPV 16 or 18 open reading frame selected from the group consisting of: E6-ORF and E7-ORF and fragments of any of the foregoing ORFs.
53. An adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:
- (a) a structural human papillomavirus polypeptide encoded by HPV 16 or 18 L1-ORF; and
- (b) an early human papillomavirus polypeptide encoded by an HPV 16 or 18 open reading frame selected from the group consisting of: E6-ORF and E7-ORF.
54. The vector of claim 53 wherein the ORFs of (a) and (b) are HPV 16 ORFs.
55. The vector of claim 53 wherein the ORFs of (a) and (b) are HPV 18 ORFs.
56. The vector of claim 53 wherein:
- (a) the ORFs of 53(a) and 53(b) are HPV 16 ORFs; and
- (b) the early human papillomavirus polypeptide is encoded by E6-ORF.
57. The vector of claim 53 wherein:
- (a) the ORFs of 53(a) and 53(b) are HPV 18 ORFs; and

(b) the early human papillomavirus polypeptide is encoded by E6-ORF.

58. The vector of claim 53 wherein:

(a) the ORFs of 53(a) and 53(b) are HPV 16 ORFs; and

(b) the early human papillomavirus polypeptide is encoded by E7-ORF.

59. The vector of claim 53 wherein:

(a) the ORFs of 53(a) and 53(b) are HPV 18 ORFs; and

(b) the early human papillomavirus polypeptide is encoded by E7-ORF.

60. A vaccine composition comprising:

(a) the vector of claim 14; and

(b) an auxiliary agent.

5, 10 B<sup>3</sup> 61. The vaccine composition of claim 49 further comprising one or more immune system-activating agents.

62. The vaccine composition of claim 49 wherein the vector is provided as a component of a cell.

63. The vaccine composition of claim 62 wherein the cell is a tumor or pre-tumor cell and is associated with human papillomavirus infection.

64. The vaccine composition of claim 63 wherein the cell is inactivated.

5, 10 B<sup>4</sup> 65. A method for activating an immune system of a subject comprising administering to the subject an adeno-associated virus vector comprising a nucleotide sequence encoding a fusion polypeptide, the fusion polypeptide comprising:

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- (a) a structural papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: L1-ORF and L2-ORF, and fragments of any of the foregoing ORFs; and
  - (b) an early papillomavirus polypeptide encoded by an open reading frame selected from the group consisting of: E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF, E7-ORF and fragments of any of the foregoing ORFs.

66. The method of claim 65 wherein the fusion polypeptide is administered as a component of a vaccine composition.

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#### REMARKS

Claims 1-13 have been cancelled and new claims 14-66 have been added.

**1. The applicants claims satisfy the written description requirement of 35 U.S.C. § 112.**

Claims satisfy the written description requirement when, as is the case in the pending claims, the specification would reasonably convince one of skill in the art that the applicant is in possession of the claimed invention.

The claims, as amended, recite a genus encompassing a limited number of combinations. In claim 14, the structural papillomavirus polypeptide must be encoded by an open reading frame selected from L1-ORF and L2-ORF, and fragments of L1-ORF and L2-ORF. The early papillomavirus polypeptide of claim 14 must be encoded by an open reading frame selected from E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF, E7-ORF and fragments E1-ORF, E2-ORF, E4-ORF, E5-ORF, E6-ORF and E7-ORF. The examples present a representative number of species of the small group of fusion polypeptides encompassed by claim 14. Accordingly, one of skill in the art would readily understand that the applicants were at the time of filing the application in possession of the small group of fusion polypeptides encompassed by the presently pending claims.